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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,234	09/17/2003	Chih-Han Chang	NTCP0004USA	3393

27765 7590 06/29/2004

NAIPO (NORTH AMERICA INTERNATIONAL PATENT OFFICE)
P.O. BOX 506
MERRIFIELD, VA 22116

EXAMINER	
NGUYEN, KHIEM D	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/605,234	CHIH-HAN CHANG	
	Examiner	Art Unit	
	Khiem D Nguyen	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Wensley et al. (U.S. Patent 6,316,310).

In re claim 1, **Wensley** discloses a method for forming a deep trench capacitor buried plate comprising: providing a substrate **100** having a pad oxide and the pad nitride layer **102** thereon (col. 2, lines 22-34), the pad oxide layer and a pad nitride layer having at least an opening; performing a dry etching process for forming a deep trench **104** in the substrate via the opening (col. 2, lines 22-34); depositing a doped silicate glass film **106** on an inner wall of the deep trench (col. 2, lines 26-34); filling a sacrificial layer **110** into the deep trench (col. 2, lines 43-49); etching back the sacrificial for exposing parts of the doped silicate glass film (col. 2, lines 50-61 and **FIGS. 3-4**); removing the exposed doped silicate glass film **(FIG. 7)**; removing the remaining sacrificial layer **(FIG. 5)**; depositing a silicon nitride layer on the inner wall of the deep trench; performing a thermal process for forming a doped region **114** at a bottom of the trench (col. 2, lines 54-61 and **FIG. 6**); removing the silicon nitride layer; and removing the doped silicate glass film (col. 2, lines 62-64 and **FIG. 7**); wherein the silicon nitride layer serves as a barrier layer for

preventing ions of the doped silicate glass film from diffusing into a collar region of the deep trench (col. 2, lines 65 to col. 3, line 20 and **FIGS. 1-9**).

In re claim 2, **Wensley** discloses wherein the doped silicate glass film **106** is an arsenic silicate glass (ASG) film (col. 2, lines 21-34).

In re claim 3, **Wensley** discloses wherein the arsenic silicate glass film is formed by a chemical vapor deposition (CVD) process (col. 2, lines 21-34).

In re claim 4, **Wensley** discloses wherein the silicon nitride layer is formed by a chemical vapor deposition process (col. 2, lines 21-42).

In re claim 5, **Wensley** discloses wherein the doped silicate glass film is removed by an anisotropic etching process (col. 2, lines 50-53).

In re claim 6, **Wensley** discloses wherein the silicon nitride layer is removed by an anisotropic etching process (col. 2, lines 21-64).

2. Claims 7-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Wensley et al. (U.S. Patent 6,316,310).

In re claim 7, **Wensley** discloses a method for forming a deep trench capacitor buried plate comprising: providing a substrate **100** having a pad oxide and the pad nitride layer **102** thereon (col. 2, lines 22-34), the pad oxide layer and a pad nitride layer having at least an opening; performing a dry etching process for forming a deep trench **104** in the substrate via the opening (col. 2, lines 22-34); depositing a doped silicate glass film **106** on an inner wall of the deep trench (col. 2, lines 26-34); filling a sacrificial layer **110** into the deep trench (col. 2, lines 43-49); removing a portion of the sacrificial for exposing parts of the doped silicate glass film (col. 2, lines 50-61 and **FIGS. 3-4**); performing an

etching process to remove the exposed doped silicate glass film and a portion of the pad nitride layer for forming a recess **(FIGS. 6-7)**; removing the remaining sacrificial layer **(FIG. 5)**; depositing a silicon nitride layer on the inner wall of the deep trench; performing a diffusing process for forming a doped region **114** at a bottom of the trench (col. 2, lines 54-61 and **FIG. 6**); removing the silicon nitride layer; and removing the doped silicate glass film (col. 2, lines 62-64 and **FIG. 7**); wherein the silicon nitride layer serves as a barrier layer for preventing ions of the doped silicate glass film from diffusing into a collar region of the deep trench (col. 2, lines 65 to col. 3, line 20 and **FIGS. 1-9**).

In re claim 8, **Wensley** discloses wherein the doped silicate glass film 106 is an arsenic silicate glass (ASG) film (col. 2, lines 21-34).

In re claim 9, **Wensley** discloses wherein the arsenic silicate glass film is formed by a chemical vapor deposition (CVD) process (col. 2, lines 21-34).

In re claim 10, **Wensley** discloses wherein the silicon nitride layer is formed by a chemical vapor deposition process (col. 2, lines 21-42).

In re claim 11, **Wensley** discloses wherein the etching process is an anisotropic etching process (col. 2, lines 50-53).

In re claim 12, **Wensley** discloses wherein the silicon nitride layer is removed by an anisotropic etching process (col. 2, lines 21-64).

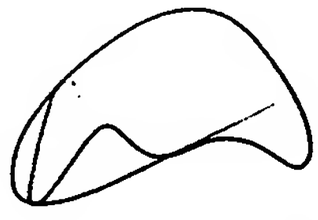
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.N.
June 23, 2004



W. DAVID COLEMAN
PRIMARY EXAMINER